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EXAMINER

O NEILL, GARY W

ART UNIT

PAPER NUMBER

2873

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Please find below and/or attached an Office communication concerning this application or proceeding.

09/923.085

DEN BOSSCHE ET AL

**Office Action Summary**

Examiner

Art Unit

Gary O'Neill

2873

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 06 August 2001 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1 ☒ Certified copies of the priority documents have been received.
- 2 ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- 3 ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other Detailed action

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## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statements***

2. Receipt is acknowledged of Information Disclosure Statements submitted 10/12/01, which have been considered by the examiner.

### ***Specification***

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### ***Claim Objections***

4. Claim 14 is objected to because of the following informalities: A spelling error in line 3 of the claim causes inconsistent terminology, wherein "... the plurality of reflective

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spatial light modulator are...". The singular "modulator" should read --modulators--.

Appropriate correction is required.

5. Claim 15 is objected to because of the following informalities: The phrase "an spatial might" appears to have spelling errors. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 14 recites the limitation "the prismatic unit" in line 4. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-5, 7-9, 11, 13-18, and 20 rejected under 35 U.S.C. 102(e) as being anticipated by Fujimori (6350033).

Fujimori discloses (fig.5), as in claim 1, a spatial light modulating unit (925) provided with a light splitting unit (910) for separating white light (W) into a plurality of light colour components (R,G,B) and a plurality of reflective spatial light modulators (925R, 925G, 925B) for modulating the light colour components. the spatial light modulating unit being enclosed by a substantially sealed chamber (col.28, lines 44-50) having walls; comprising a cooling system (col. 3, lines 16-62) for cooling each reflective spatial light modulator, the cooling system providing a heat path connection through a wall (col.3,lines 63-67, thermal exchange, & col.4, lines 1-6, 63-67) of the sealed chamber for cooling each reflective spatial light modulator, the cooling system being heat conductively connected to each reflective spatial light modulator (col.5, lines 1-15).

Fujimori discloses as in claim 2, the spatial light modulating unit wherein each path of the light colour component to the reflective spatial light modulators is distal from the corresponding heat path connection (fig.5).

Fujimori discloses as in claim 3, the spatial light modulating unit wherein the heat path connection is a passive cooling system (col.3, lines 1-30, radiating fins).

Fujimori discloses as in claim 4, the spatial light modulating unit wherein the heat path connection is formed from heat conductive material (col.3, lines 1-15, aluminum).

Fujimori discloses as in claim 5, the spatial light modulating unit further comprising a forced convective cooling means (col.3, lines 40-67, cooling fan) for cooling the light splitting unit inside the substantially sealed chamber.

Fujimori discloses as in claim 7, the spatial light modulating unit wherein a heatsink is connected to the heat path connection at the outside of the substantially sealed chamber (col.5, lines 50-59, fins).

Fujimori discloses as in claim 8, the spatial light modulating unit wherein the heat path connection is an active cooling system (col.6, lines 5-12, Peltier).

Fujimori discloses as in claim 9, the spatial light modulating unit wherein a Peltier junction cooling element is connected to the heat path connection at the outside of the substantially sealed chamber (col.6, lines 5-12, Peltier).

Fujimori discloses as in claim 11, the spatial light modulating unit wherein each reflective spatial light modulator is a controllable mirror reflection device (col.29, lines 5-15, micromirrors).

Fujimori discloses as in claim 13, the spatial light modulating unit wherein the light splitting unit is a prismatic device (910).

Fujimori discloses as in claim 14, the spatial light modulating unit (fig.5) wherein the light splitting unit (910) is located substantially centrally in the sealed chamber and the plurality of reflective spatial light modulator (925R, 925G, 925B) are arranged about the central light splitting unit between the prismatic unit and a wall of the sealed chamber, each heat path connection transferring heat in a starting direction substantially the same as the direction of light incident on each reflective spatial light modulator (col 4, lines 63 & col.5, lines 1-22).

Fujimori discloses as in claim 15, a projector apparatus (1) having an spatial light modulating unit (fig.6).

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Fujimori discloses as in claim 16, a method (fig.5) of cooling a projector apparatus (1) having an spatial light modulating unit (925) provided with a plurality of reflective spatial light modulators (925R, 925G, 925B), and a light splitting unit (910) for splitting white light (W) into component colours (R,G,B). the spatial light modulating unit being enclosed by a substantially sealed chamber (col.28, lines 44-50) having walls, the method comprising the step of cooling (col.3, lines 16-62) each reflective spatial light modulator via a heat path connection through a wall (col.3, lines 63-67, thermal exchange. & col.4, lines 1-6, 63-67) of the sealed chamber, the heat path connection being heat conductively connected to each reflective spatial light modulator (col.5, lines 1-15).

Fujimori discloses as in claim 17, the method wherein the heat path connection is a passive cooling system (col.3, lines 1-30, radiating fins).

Fujimori discloses as in claim 18, the method further comprising the step of forced convective cooling (col.3, lines 40-67, cooling fan) the light splitting unit (910) inside the substantially sealed chamber.

Fujimori discloses as in claim 20, the method wherein the heat path connection is an active cooling system (col.6, lines 5-12, Peltier).

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 6, 10, 12, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori (6350033) as applied to claims 1 and 16 above, and further in view of Colpaert et al. (6416183).

Fujimori discloses the claimed invention as cited above except for a spatial light modulating unit adapted to remove black light out of the substantially sealed chamber, a reflective LCD, and a DMD, as cited in claims 6, 10, 12, and 19. Within the same field of endeavor, Colpaert et al. provides disclosure of a spatial light modulator unit (fig.2) which may use a reflective LCD or a DMD (col.3, lines 25-32), or adapted to remove black light (inherent in DMD: see specification col.4, lines 8-12).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide the reflective LCD or DMD of Colpaert et al. as the spatial light modulating unit of Fujimori for the purpose of providing design choice in the construction of the light modulation unit (Colpaert et al., col. 5, lines 10-63).

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are being cited for disclosing enclosed spatial light modulating units with light splitting units and cooling systems: Fujimori (6007205); Haba (6428170); Ono et al. (6450646); and Van den Bossche (EP1193982).



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary O'Neill whose telephone number is 703-306-4828. The examiner can normally be reached on Monday - Thursday, 6:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y Epps can be reached on 703-308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7725 for regular communications and 703-308-7725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Gary O'Neill  
Examiner  
Art Unit 2873

GO  
January 29, 2003

